

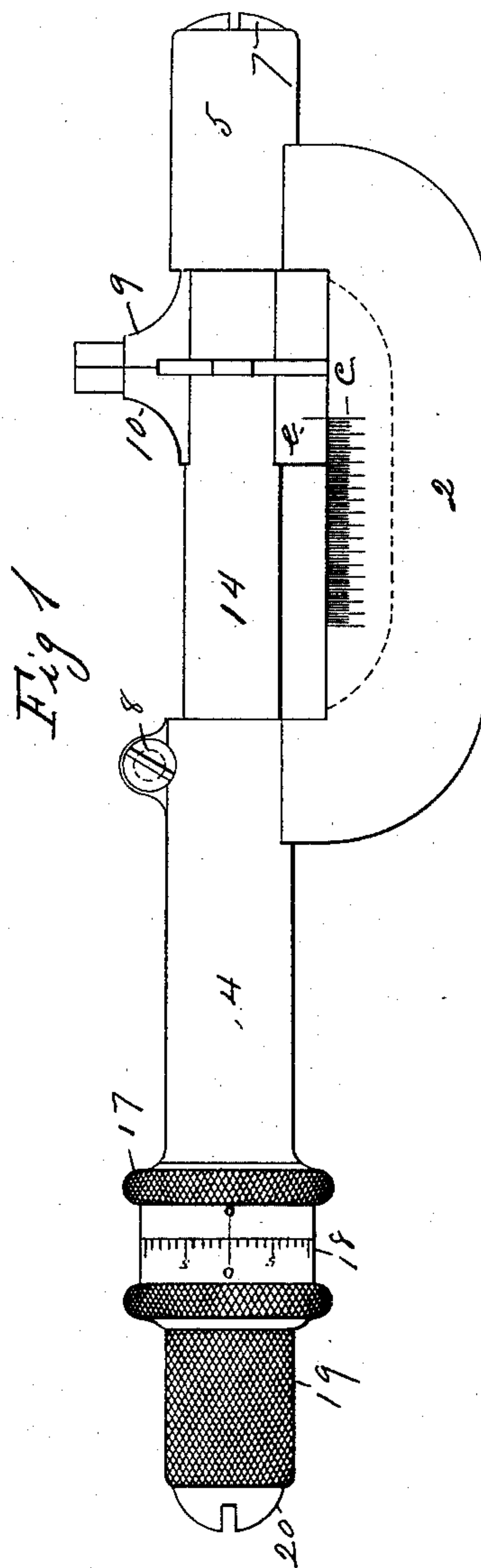
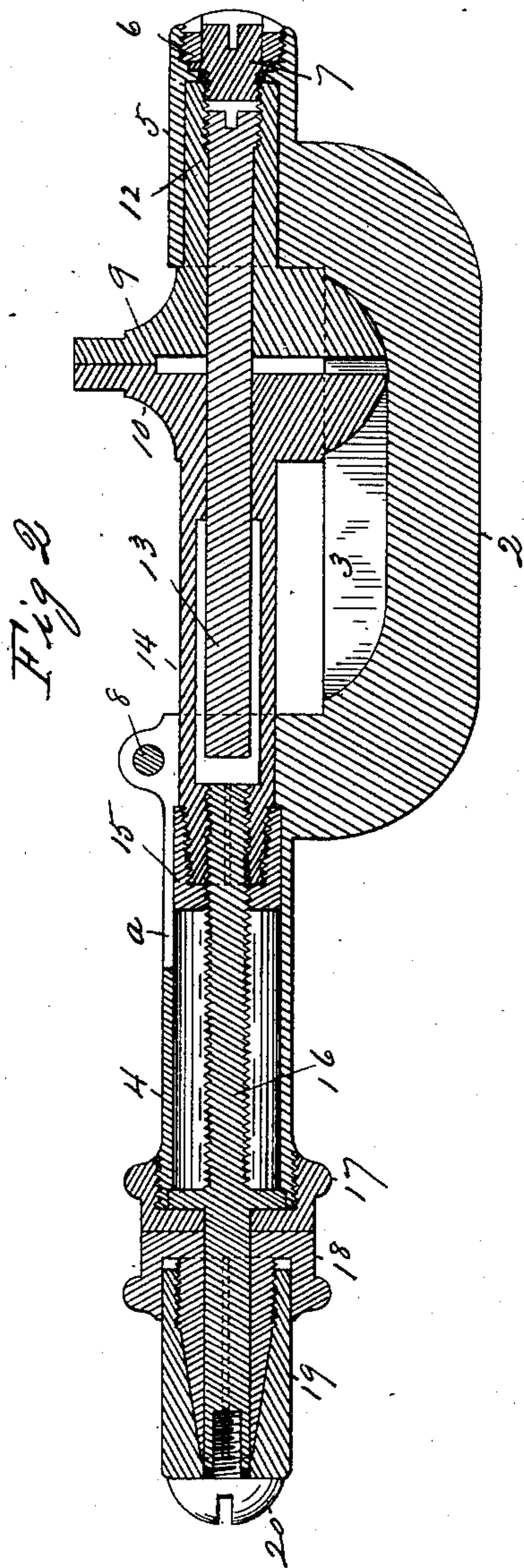
(No Model.)

A. E. WHITMORE.

MICROMETER GAGE.

No. 363,709.

Patented May 24, 1887.



Witnesses
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MICROMETER-GAGE.

SPECIFICATION forming part of Letters Patent No. 363,709, dated May 24, 1887.

Application filed February 5, 1887. Serial No. 226,609. (No model.)

To all whom it may concern:

Be it known that I, ANDREW E. WHITMORE, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Micrometer-Gages, of which the following is a specification.

This invention relates to micrometer-gages, the object being to provide a gage of this class of improved construction for inside and outside measurements; and the invention consists in the peculiar construction and arrangement of the details of the instrument, all as hereinafter fully described, and pointed out in the claims.

In the drawings forming part of this specification, Figure 1 is a side elevation, and Fig. 2 a longitudinal sectional view, of a micrometer-gage embodying my improvements.

In the drawings, 2 indicates the frame of the instrument, having a longitudinal slot, 3, in the body portion thereof, as shown in Fig. 2 and as indicated by a dotted line in Fig. 1. On the end of the frame opposite to that on which is the handle 4 is a tubular projection, 5, the outer end of which is internally screw-threaded, and into which is screwed a nut, 6, which nut encircles the end of an adjusting-screw, 7, the use of which is below described. The said handle 4 is hollow, as shown, and is slotted longitudinally a portion of its length, as shown at *a*, Fig. 2, and is provided with a boss on that portion thereof, through which a screw, 8, is placed, and the extreme end of said handle is screw-threaded on its outside, as shown.

The instrument is provided with two jaws, 9 and 10, the former of which occupies normally a fixed position in the instrument, but is adjustable therein, and is held in a fixed position by means of the below-described construction. Said jaw 9 has a portion thereof entering the aforesaid groove 3 in the frame, and it has a sleeve, 12, thereon, which enters the aforesaid tubular projection 5 of said frame, which sleeve is internally screw-threaded to receive the end of the aforesaid screw 7, said screw having a collar thereon, as shown, which has a bearing against an annular projection 50 on the inner side of the said tubular projection

5 on the frame, said screw being held in that position by the said nut 6. By turning back said nut slightly, the screw 7 may be turned to adjust the jaw 9 in the frame, to compensate for any wear and to bring it to a proper relative position opposite the movable jaw 10. The said jaw 9 has attached thereto by a screw-thread, as shown, the jaw-spindle 13, the latter being screwed by one end into the sleeve 12 of the jaw 9, and extending therefrom across the opening in the frame in which both of the jaws of the instrument are located. The movable jaw 10 has, like said jaw 9, a portion thereof entering the said groove 3 in the frame, and it has a sleeve, 14, thereon, the end of which enters the hollow handle 4 of the instrument, the end of said sleeve 14 being slotted or split, as shown by dotted lines in Fig. 2, and having its end tapered and screw-threaded, as shown, and having fitted thereon an internally-tapered cap, 15, having a hole through its end. The end of said sleeve 14 is also internally screw-threaded, as shown, and when the parts are in operative position, as shown in Fig. 2, the said jaw-spindle 13 has one end extending through the jaw 10, and its sleeve 14 longitudinally nearly to the end of the latter, the sleeve 14 being chambered out, as shown, so that the jaw 10 has a bearing on said spindle for only a certain distance on the latter, thereby obviating any unnecessary friction. A jaw-operating screw, 16, having one end entering the end of said sleeve 14, is placed in the handle 4 of the instrument, and has a collar thereon, which fits in an annular groove in the inner side of the end of the handle, and a nut, 17, is screwed onto the end of the handle 4, the extreme end of the said operating-screw passing through said nut, the latter holding the screw 16 in proper position while it is turned to move the jaw 10. The spindle 13 serves to secure the proper alignment of the movable jaw 10. A sleeve, 18, having a knurled border and a tapered end, which is slotted or split, as shown in Fig. 2, is fitted onto the end of the operating-screw 16, said sleeve 18 having a screw-threaded socket formed therein to receive one end of a nut, 19, which is internally tapered to correspond with the tapered end of said sleeve 18. A screw, 20, is placed in the

end of the operating-screw 16, and serves to retain the nut 19 in proper position after it is adjusted on the sleeve 18. The abutment of the end of the sleeve 18 against the nut 17 obviates any danger that said nut can become unscrewed, and thereby cease to retain the operating-screw in proper position, or so that it can have no endwise movement, and the split feature of the sleeve 18, together with its tapered form, combined with the hollow tapered nut 19 and the end screw, 20, provides ample means for retaining the sleeve 18 in place on the end of the operating screw and against the nut 17, and for adjusting said parts as may be needed to take up for all wear, thereby insuring the greatest accuracy of measurement, as indicated by the movement of the jaw 10.

The side of the frame 2 adjoining the jaws 9 and 10 has formed thereon a series of suitable graduation-marks, *c*, as shown, and a line, *e*, is placed on the side of the movable jaw 10, for the purpose of indicating co-operatively with said marks *c* the degree of separation of jaw 10 from jaw 9. Also a series of micrometric graduation-marks is placed on the surfaces of the nut 17 and the sleeve 18, whose ends abut, as shown, and said marks indicate the degree of the movement of jaw 10 when sleeve 18 is turned.

In constructing the end of the sleeve 14 of the movable jaw as above described, and attaching thereto the tapered hollow cap 15, particular attention has been paid to the provision of suitable means for keeping such a close fit between the end of the operating-screw 16 and the sleeve of the movable jaw 10 that no movement of the latter can take place, be it more or less, except it be caused by turning said screw. In other words, by the cap 15 the end of said sleeve 14 is invariably kept tightly bound around the end of the operating-screw, so that there can be no "lost motion" between the screwed parts which would conduce to inaccuracy of measurement.

The within-described micrometer-gage is adapted equally for external and internal measurements, the ends of the jaws, as shown, being of such form as adapts them to be inserted into holes or spaces of slight width, and the above-described numerous provisions for the adjustment of the various parts of the instrument assure its perfect accuracy.

What I claim as my invention is—

1. In a micrometer-gage, the frame 2, having a longitudinal slot therein and provided with a hollow handle, a normally-fixed jaw

having an engagement with said slot and having a sleeve thereon entering the frame, and a screw-connection with the latter, substantially as described, whereby said jaw is adjustably connected to said frame, combined with a movable jaw, also having an engagement with said slot, and having a hollow sleeve thereon entering said handle, an operating-screw, substantially as described, attached to said handle and having one end engaging with said movable-jaw sleeve, and the jaw-spindle 13, attached to the said normally-fixed jaw and extending through the movable jaw into the said sleeve thereof, substantially as set forth.

2. The combination, with the frame 2, having the tubular projection 5, of the jaw 9, having a hollow sleeve entering said projection, the screw 7, entering the end of said sleeve, and the nut 6, screwing into said tubular projection, substantially as set forth.

3. The jaw 9, having an internally-screwed sleeve thereon, the movable jaw 10, and its hollow sleeve 14, combined with the jaw-spindle 13, having one end screwed into the sleeve of said jaw 9, and passing through the latter and the movable jaw 10 in the direction of its movement into the sleeve thereof, substantially as set forth.

4. In combination with the frame 2 and the movable jaw having the hollow sleeve 14, the operating-screw 16, secured by a nut to the end of the handle 4 and entering the end of said sleeve, and a suitable sleeve secured on said screw beyond the end of the handle of the instrument for operating said screw, substantially as set forth.

5. In combination with the frame 2 and the movable jaw having the hollow split sleeve 14, the operating screw 16, secured by a nut to the end of the handle 4 and entering the end of said sleeve, the tapering cap 15, screwing onto the end of said sleeve, and a suitable sleeve secured on the outer end of said screw for operating the same, substantially as set forth.

6. In combination with the handle 4 and the operating-screw 16, having a collar thereon fitting the end of said handle, the nut 17, screwing onto the latter, the tapering split sleeve 18, fitting the end of said screw, and the hollow nut 19, having a screw-connection with said sleeve, substantially as set forth.

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